RESEARCH ARTICLE

ECONOMICS OF PRODUCTION AND MARKETING OF BRINJAL IN BILASPUR DISTRICT OF CHHATTISGARH STATE

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Abstract: The study was conducted to work out the cost and return of brinjal production in Bilaspur District of Chhattisgarh. One hundred fifty four vegetable growers were selected randomly from four blocks namely Bilha, Masturi, Kota and Takhatpur. The primary data were collected for the year 2013-14. The study observed average size of farm 1.76 hectare. The dugwell was observed as major source of irrigation as irrigated area from it found to be 41.45 per cent. On an average, the cost of cultivation of brinjal, was amounted as Rs 51781.71/ha. The major share of cost of cultivation gone to labour cost. The cost of production of brinjal was calculated as Rs 284.88/q. The net return against the cost of cultivation was observed Rs 109382.94/ha and cost of production found to be Rs 601.79/q. The input – output ratio of brinjal came to 1:3.11. There were two marketing channels identified in the study area. Channel- I: Producer - consumer. Channel-II: Producer – commission agent/retailer. The channel-I found more efficient as 51.54 than channel –II for the selected vegetable. The study suggested that the labour cost must be reduced to enhance the economic viability of the production and shortest marketing channel must be encouraged by the government as short marketing channel possess more marketing efficiency.

Keywords: Cost of cultivation, Cost of production, Output Input Ratio, Marketing channel

INTRODUCTION

It has been observed that economic returns to vegetables are better than other several crops. The yield per unit area is high and suitable for intensive farming lead generation of supplement incomes and expands employment through it. Vegetables are always been a better choice of crop diversification because of good productivity and much higher returns from a unit area. The diversification in favour of these crops improves exports, reduce trade deficit, besides creating more direct and indirect employment. Chhattisgarh State has to go long way in vegetable production. In the State, there is remarkable gap between actual harvested yield and potential yield of vegetable crops. Hence, scope for harnessing/exploiting potential fully still exists. In the State, during 2010-11 vegetables occupied an area of 0.346 million hectares with the production 4.25 million metric tonnes which accounted 4.1 and 2.9 per cent over the national figures, respectively. The productivity of State 12.3 metric tonnes was quite less than the national average i.e. 17.3 metric tonnes. According to the data from Directorate Horticulture, Chhattisgarh the coverage of vegetables in the year 2010-11 was maximum in Bilaspur as 68348.76 hectares which was 20.41 percent of total area in the State followed by Durg, Surguja and Raipur with 14.82, 14.21 and 11.09 percent, respectively. Though, vegetables are grown more or less in all the Districts of the State, brinjal is one of the vegetables which have large area coverage as 7.97 per cent in the State with the production 439518.90 MT. In Bilaspur District brinjal occupied an area of 1732.15 ha which was 2.53 per cent to total area of vegetables in the District with the production 25809.04 MT (*data 2010-11*). Data reveals that brinjal is popular vegetable which have great economic important to the farmers. Therefore, the economic study of brinjal production and marketing is pertinent. Hence, the study has been under taken in Bilaspur with the following objectives.

Objectives

1. To examine the cost and return of brinjal production on selected households.
2. To find out the marketing pattern of brinjal in the study area.

MATERIAL AND METHOD

The study was conducted in Bilaspur District of Chhattisgarh State. A 10 per cent respondent was selected at random with the sample size of 154 farmers from four Blocks namely Bilha, Masturi, Kota and Takhatpur of the District. The farmers were categorized into four groups on the basis of their land holdings viz marginal, small, medium and large. A 10 per cent intermediary was selected at random with the sample size 30 from the market. The study was based on primary data for the agricultural year 2013-14. The following analytical procedure was adopted to analyse the data:

Cost of cultivation

To work out the cost of cultivation simple arithmetic and statistical techniques of analysis viz. average,

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percentage and standard method of cost of cultivation were adopted.

The study worked out the cost of production of brinjal as per the definition given by Commission on Agricultural Costs and Prices (CACP) that are as follows;

Cost A1 = Value of purchased material inputs (seed, insecticides and pesticides, manure, fertilizer), hired human labour, animal labour (hired and owned), hired farm machinery, depreciation on farm implements and farm buildings, irrigation charges, land revenue cesses and other taxes, and interest on working capital.

Cost A2 = Cost A1 + rent paid for leased-in land.

Cost B1 = Cost A1+ interest on value of owned capital assets (excluding land).

Cost B2 = Cost B1+ rental value of owned land (net of land revenue) and rent paid for leased-in land.

Cost C1 = Cost B1 + Imputed value of family labour.

Cost C2 = Cost B2 + Imputed value of family labour.

Cost C3 = Cost C2+ 10% of Cost C2 on account of managerial functions performed by farmer.

Marketing Cost, Margins and Price Spread

$C = C_f + C_{m1} + C_{m2} + C_{m3} + \ldots C_{mn}$

Where, C = Total cost of marketing of the commodity

C_f = Cost paid by the producers from the time producer leaves the farm till he sells it, and

C_{mi} = Cost incurred by the i^{th} middleman in the process of buying and selling the product.

Gross Margin

$$M = S_i - P_i$$

Where, M = Gross margin

S_i = Sale value of produce for i^{th} middleman

P_i = Purchase value for i^{th} middleman

i = Type of i^{th} middleman

Net Margin of market intermediaries

$$N_{mi} = P_{ri} - (P_{pi} + C_{mi})$$

Where, N_{mi} = Net margin of i^{th} type of market middleman

P_{ri} = Total value of receipts per unit (Sale)

P_{pi} = Per unit purchase price of goods by the i^{th} middleman

C_{mi} = Per unit marketing cost incurred by the i^{th} middleman

Producer's Price

$$P_F = P_A - C_F$$

Where, P_F = Net price received by farmer

P_A = Wholesale price

C_F = The marketing cost incurred by the farmer

Producer's share in consumer rupee

$$P_S = (P_F / P_R)\ 100$$

Where, P_S = Producers share in consumer rupee

P_F = Net price received by farmer

P_R = Price paid by the consumer

Marketing Efficiency

$$ME = (V/I) - 1$$

Where, ME= Index of marketing efficiency

V= Value of the goods sold or price paid by the consumer

I = Total marketing cost or input of marketing

RESULT AND DISCUSSION

The results obtained from the study as well as discussions have been summarized under following heads:

Economics of brinjal

Table 1 showed an overall average total cost of brinjal cultivation as Rs 51781.71/ ha. The expenditure on hired labour accounted for a major proportion 21.28 per cent of the total cost followed by family labour 19.22 per cent, machine power 9.70 per cent and manure and fertiliser 9.56 per cent.

The cost of cultivation per hectare showed a rising trend with the rise in the size of farm as it turned out to be Rs 49504.15/ha, Rs 51340.78/ha, Rs 51914.65/ha and Rs 54367.24/ha on marginal, small, medium and large size farms respectively. Expenditure on family labour amounted higher as 34.45 per cent and 33.87 per cent on small and marginal farms respectively. The paramount expenditures occurred on hired labour with 37.25 per cent and 35.23 per cent on large and medium farms respectively. Machine power was utilised maximum on large and medium farms as amounted Rs 6751.33/ha and Rs 6586.67/ha that were 12.42 and 12.69 per cent to respective total costs. Manure and fertiliser expenses were maximum on large farm as Rs 5092.24/ha followed by medium with Rs 5021.60/ha while least expenses found on marginal farm as Rs 4671.11/ha.

Table 1. Cost of cultivation of brinjal on different size group of farms. (Rs/ha)

Sl. No.	Particulars		Category of vegetable growers				Overall average
			Marginal	Small	Medium	Large	
A.	Labour Cost						
	(i)	Family labour	16765.37	17686.93	3183.56	2177.72	9953.39
			(33.87)	(34.45)	(6.13)	(4.01)	(19.22)
	(ii)	Hired labour	2374.63	3159.45	18287.98	20249.88	11017.99

			(4.80	(6.15)	(35.23)	(37.25)	(21.28)
	(iii)	Bullock labour	4544.01	1479.44	0.00	0.00	1505.86
			(9.18)	(2.88)	(0.00)	(0.00)	(2.91)
	(iv)	Machine power	1570.85	5181.59	6586.67	6751.33	5022.61
			(3.17)	(10.09)	(12.69)	(12.42)	(9.70)
		Total Labour Cost	25254.86	27507.41	28058.20	29178.93	27499.85
			(51.02)	(53.58)	(54.05)	(53.67)	(53.11)
B.	Material Cost						
	(i)	Seed	3089.27	3056.51	3183.56	3276.87	3151.55
			(6.24)	(5.95)	(6.13)	(6.03)	(6.09)
	(ii)	Manure and fertilizer	4671.11	5008.39	5021.60	5092.24	4948.34
			(9.44)	(9.76)	(9.67)	(9.37)	(9.56)
	(iii)	Plant protection	1141.06	1186.27	1288.79	1314.20	1232.58
			(2.30)	(2.31)	(2.48)	(2.42)	(2.38)
	(iv)	Irrigation	940.34	938.60	1142.69	1037.40	1014.76
			(1.90)	(1.83)	(2.20)	(1.91)	(1.96)
		Total Material Cost	9841.79	10189.76	10636.64	10720.71	10347.22
			(19.88)	(19.85)	(20.49)	(19.72)	(19.98)
C.	Total Working Cost (A+B)		35096.65	37697.17	38694.84	39899.64	37847.08
			(70.90)	(73.43)	(74.54)	(73.39)	(73.09)
D.	Other Costs						
	(i)	Depreciation	206.66	202.76	294.45	314.99	254.72
			(0.42)	(0.39)	(0.57)	(0.58)	(0.49)
	(ii)	Interest on working capital	2035.61	2186.44	2244.30	2314.18	2195.13
			(4.11)	(4.26)	(4.32)	(4.26)	(4.24)
	(iii)	Land revenue	12.00	12.00	12.00	12.00	12.00
			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
	(iv)	Rent paid for leased in land	73.54	120.81	130.11	90.23	103.67
			(0.15)	(0.24)	(0.25)	(0.17)	(0.20)
	(v)	Rental value of land	7384.53	6199.01	5564.19	6538.49	6421.56
			(14.92)	(12.07)	(10.72)	(12.03)	(12.40)
	(vi)	Interest on value of own capital	194.79	255.24	255.24	255.24	240.13
			(0.39)	(0.50)	(0.49)	(0.47)	(0.46)
		Total Cost	9907.12	8976.26	8500.30	9525.12	9227.20
			(20.01)	(17.48)	(16.37)	(17.52)	(17.82)
E.		Total Cost (C+D)	45003.77	46673.43	47195.14	49424.77	47074.28
			(90.91)	(90.91)	(90.91)	(90.91)	(90.91)
F.		Managerial Cost	4500.38	4667.34	4719.51	4942.48	4707.43
			(9.09)	(9.09)	(9.09)	(9.09)	(9.09)
G.		Grand Total (E+F)	49504.15	51340.78	51914.65	54367.24	51781.71
			(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note- Figures in parentheses show per cent to the total.

Table 2 depicted cost of cultivation of brinjal as per cost concept. An overall farms average of Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3 turned out to be Rs 22061.38/ha, Rs 22165.05/ha, Rs 22301.51/ha, Rs 28826.74/ha, Rs 40549.05/ha Rs 47074.28/ha and Rs 51781.70/ha respectively. Cost A1 was higher on medium farm as Rs 22957.61/ha while least on marginal farm with Rs 20585.54/ha whereas, Cost A2 was higher on medium farm with Rs 23087.72/ha and minimum on marginal farm as 20659.08/ha.

Table 2. Break-up of cost of cultivation of brinjal on different size group of farms. (Rs/ha)

Sl. No.	Particulars	Category of vegetable growers				Overall average
		Marginal	Small	Medium	Large	
1.	Cost A1	20585.54	22411.44	22957.61	22290.93	22061.38
2.	Cost A2	20659.08	22532.25	23087.72	22381.16	22165.05
3.	Cost B1	20780.33	22666.68	23212.85	22546.17	22301.51
4.	Cost B2	28238.39	28986.50	28907.16	29174.88	28826.74
5.	Cost C1	37545.70	40353.61	41500.83	42796.05	40549.05
6.	Cost C2	45003.77	46673.44	47195.14	49424.77	47074.28
7.	Cost C3	49504.14	51340.78	51914.65	54367.24	51781.70

Table 3 revealed that an overall average cost of production of brinjal per quintal accounted for Cost A1, Cost A2, Cost B1, Cost B2, Cost C1, Cost C2 and Cost C3 as Rs 121.37/q, Rs 121.94/q, Rs 122.69/q, Rs 158.59/q, Rs 223.09/q, Rs 258.99/q and Rs 284.88/q respectively. While, the respective net returns over the cost of production from Cost A1 to Cost C3 were Rs 765.30/q, Rs 764.73/q, Rs 763.98/q, Rs 728.08/q, Rs 663.58/q, Rs 627.68/q and Rs 601.79/q. The large farm received higher net return over Cost A1 and Cost A2 with Rs 767.95/q and Rs 767.47/q and minimum net return gained by medium farm for respective cost as Rs 761.89/q and Rs 761.18/q. On other side, net return over Cost C3 was maximum on small farm and minimum on large farm with Rs 607.94/q and Rs 597.11/q respectively.

Table 3. Economics of production of brinjal on different size groups of farms.

Sl. No.	Particulars		Farm size				Overall average
			Marginal	Small	Medium	Large	
1.	Cost of production Rs/q						
	Cost A1		120.30	121.67	124.78	118.72	121.37
	Cost A2		120.73	122.33	125.49	119.20	121.94
	Cost B1		121.43	123.06	126.17	120.08	122.69
	Cost B2		165.02	157.37	157.12	155.38	158.59
	Cost C1		219.41	219.08	225.58	227.93	223.09
	Cost C2		262.99	253.39	256.53	263.23	258.99
	Cost C3		289.29	278.73	282.18	289.56	284.88
2.	Net return Rs/q						
	Cost A1		766.37	765.00	761.89	767.95	765.30
	Cost A2		765.94	764.34	761.18	767.47	764.73
	Cost B1		765.24	763.61	760.50	766.59	763.98

		Cost B2		721.65	729.30	729.55	731.29	728.08
		Cost C1		667.26	667.59	661.09	658.74	663.58
		Cost C2		623.68	633.28	630.14	623.44	627.68
		Cost C3		597.38	607.94	604.49	597.11	601.79
3.	Net return Rs/ha							
		Cost A1		131145.33	140906.68	140169.78	144191.27	139103.27
		Cost A2		131071.79	140785.87	140039.67	144101.04	138999.59
		Cost B1		130950.54	140651.44	139914.54	143936.03	138863.14
		Cost B2		123492.48	134331.62	134220.24	137307.31	132337.91
		Cost C1		114185.17	122964.51	121626.56	123686.14	120615.60
		Cost C2		106727.11	116644.69	115932.26	117057.43	114090.37
		Cost C3		102226.73	111977.34	111212.75	112114.95	109382.94

Table 4 revealed that an overall average value of net return, family labour income and farm business income of brinjal farm to be Rs 109382.94/ha, Rs 138999.59/ha and Rs 132337.91/ha respectively. The overall average input-output ratio in brinjal worked out to be 1:3.11 on the sample farms. The cost and return of brinjal production on different categories of farm sizes were at par though small farm had maximum input-output ratio as 1:3.18 while large farm had minimum input-output ratio as 1:3.06.

Table 4. Cost and return of brinjal on the sampled farms. (Rs/ha)

Sl. No.	Particulars	Farm size				Overall average
		Marginal	Small	Medium	Large	
1.	Cost C3 (Rs)	49504.14	51340.78	51914.65	54367.24	51781.70
2.	Yield (q)	171.12	184.19	183.98	187.76	181.76
3.	Average price received	886.67	886.67	886.67	886.67	886.67
4.	Output value	151730.87	163318.12	163127.40	166482.19	161164.65
5.	Net Income	102226.73	111977.34	111212.75	112114.95	109382.94
6.	Input-Output ratio	1: 3.07	1: 3.18	1: 3.14	1: 3.06	1: 3.11

Marketing channel of brinjal

There two marketing channels were identified in the marketing of brinjal in the study area as.

Channel I: Producer - Consumer

Channel II: Producer – Commission agent/ Retailer-Consumer

The Table 5 revealed that marketing channel- I was more efficient as efficiency estimated to be 51.54 against channel – II as 11.77.

Table 5. Marketing cost, margin and price spread of brinjal on different size group of farms. (Rs/q)

S. No.	Particulars		Marketing channel - I		Marketing channel - II
			Farm size		Farm size
			Average		Average
1	Farmer				
		Farmer's price	2094.24		819.19
			(98.37)		(36.76)
		Marketing cost	40.52		167.48
			(1.90)		(7.52)
2	Commission agent /Retailer				
		Marketing cost	0.00		7.08
			(0.00)		(0.32)
		Marketing margin	0.00		1234.54
			(0.00)		(55.40)
3.	Consumer				
		Consumer price	2129.00		2228.29
			(100.00)		(100.00)
	Marketing efficiency		51.54		11.77

Note: Figures in parentheses indicate percentage to total.

CONCLUSION

The found major findings as on an average, the cost of cultivation of brinjal, was amounted as Rs 51781.71/ha. The major share of cost of cultivation gone to labour cost. The cost of production of brinjal, was calculated as Rs 284.88/q. The net return against the cost of cultivation and production observed Rs 109382.94 and Rs 601.79/q. The input – output ratio of brinjal came to 1:3.11. There were two marketing channels identified in the study area. Channel- I: Producer - consumer. Channel-II: Producer – commission agent/retailer. The channel-I found more efficient than channel –II for the selected vegetables. The study suggested that the labour cost must be reduced to enhance the economic viability of the production and shortest marketing channel should be encouraged in policy framework by the government as short marketing channel possess greater marketing efficiency.

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